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10/698,318	10/31/2003	Jon Irvin Stuckey	P02073US2A	9814

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Michael R. Huber
BRIDGESTONE AMERICAS HOLDING, INC.
1200 Firestone Parkway
Akron, OH 44317

EXAMINER

GUILL, RUSSELL L

ART UNIT	PAPER NUMBER
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2123

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/698,318

Applicant(s)

STUCKEY, JON IRVIN

Examiner

Russ Guill

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/6/2004, 4/8/2004, 4/15/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to a restriction election and an amendment filed January 19, 2007. Claims 1 - 18 and 21 - 22 have been examined. Claims 1 - 18 and 21 - 22 have been rejected.

Election/Restriction

2. Applicant's election without traverse of claims 1 - 18 in the reply filed on January 19, 2007 is acknowledged.
3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

4. Cited references 20 and 24 on the Information Disclosure Statement dated April 15, 2004 were not considered because no date was provided. Cited references 20 and 24 fail to comply with 37 CFR 1.98(b)(5) which requires that each reference must be identified by a date.

Drawings

5. The drawings are objected to because Figure 12 and Figure 13 are hand drawn. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior

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version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities: On page 10, line 11, the phase angles are referred to a f_k . The phase angles appear to be ϕ_k .

Appropriate correction is required.

Claim Objections

7. Claim 1 is objected to because of the following minor informalities: the claim recites in line 3, "the amplitudes". Further, the specification appears to allow only a single amplitude for each modulation order. For the purpose of claim examination, the limitation is interpreted as "defining an amplitude for each modulation order".

Correction or amendment is required.

8. Claim 1 is objected to because of the following minor informalities: the claim recites in line 3, "the phases". Further, the specification appears to allow only a single phase for each modulation order. For the purpose of claim examination, the phrase, "the phases" is interpreted as "a phase". Correction or amendment is required.

9. Claim 15 is objected to because of the following minor informalities: the claim recites in the preamble, "defining a tire noise pitch sequences". The phrase appears to have a minor grammatical error. Appropriate correction is required.

10. Claim 15 is objected to because of the following minor informalities: the claim recites in line 2, "the characteristics". For the purpose of claim examination, the phrase is interpreted as "characteristics".

11. Claim 16 is objected to because of the following minor informalities: the claim recites in line 2, "the amplitudes". For the purpose of claim examination, the phrase is interpreted as, "amplitudes".

12. Claim 16 is objected to because of the following minor informalities: the claim recites in line 2, "the phases". For the purpose of claim examination, the phrase is interpreted as, "a phase".

13. Claim 21 is objected to because of the following minor informalities: the claim recites in line 4, "the amplitudes". The specification appears to allow only a single amplitude for each modulation order. For the purpose of claim examination, the limitation is interpreted as "defining an amplitude for each modulation order" (please refer to the next limitation for comparison). Correction or amendment is required.

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14. Claim 21 is objected to because of the following minor informalities: the claim recites in line 5, "the phases". The specification appears to allow only a single phase for each modulation order. For the purpose of claim examination, the phrase, "the phases" is interpreted as "a phase". Correction or amendment is required.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

a. **Claims 1 - 18 and 21 - 22** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i. Regarding claim 1, the claim recites in lines 4 - 5, "creating a function for each modulation order that includes the defined amplitudes and phases". It is unclear whether each function contains all defined amplitudes and phases, or whether each function includes only the defined amplitude and phase for the modulation order. For the purpose of claim examination, the phrase is interpreted as "creating a function for each modulation order that includes the defined amplitude and phase of the modulation order". Correction or amendment is required.

ii. Regarding claim 1, the claim recites in lines 5 - 6, "summing the functions that define the modulation orders". It is unclear whether, and how, the previously defined functions define the modulation orders. For the purpose of claim examination, the phrase is interpreted as "summing the created functions for each modulation order". Correction or amendment is required.

iii. Regarding claim 3, the claim recites in lines 3 - 4, "the accumulation of the deviation of the arc length from the arc length of the mean pitch size". The meaning of the phrase is unclear, and therefore the metes and bounds of the claim cannot be determined. For the purpose of claim examination, the phrase is interpreted as not being in the claim.

iv. Regarding claim 5, the claim recites in line 2, "the total number of pitches". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "a total number of pitches".

v. Regarding claim 5, the claim recites in line 2, "the number of different pitch sizes". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "a number of different pitch sizes".

vi. Regarding claim 5, the claim recites in lines 2 - 3, "the pitch ratios". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "pitch ratios".

vii. Regarding claim 6, the claim recites in line 2, "the total number of pitches". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "a total number of pitches".

viii. Regarding claim 6, the claim recites in line 2, "the number of different pitch sizes". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "a number of different pitch sizes".

ix. Regarding claim 6, the claim recites in lines 2 - 3, "the pitch ratios". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "pitch ratios".

x. Regarding claim 15, the claim recites in lines 4 - 5, "to provide preferred modulation characteristics and good level characteristics". First, it is unclear whether the phrase is a functional limitation or an intended use. Also, the adjectives "preferred" and "good" appear to be vague and indefinite because one cannot determine the metes and bounds of the limitation. For the purpose of claim examination, the phrase is interpreted as not being in the claim.

xi. Regarding claim 16, the claim recites in lines 3 - 4, "creating a function for each modulation order that includes the defined amplitudes and phases". It is unclear whether each function contains all defined amplitudes and phases, or whether each function includes only the

defined amplitude and phase for the modulation order. For the purpose of claim examination, the phrase is interpreted as "creating a function for each modulation order that includes the defined amplitude and phase of the modulation order". Correction or amendment is required.

xii. Regarding claim 16, the claim recites in lines 4 - 5, "summing the functions that define the modulation orders". It is unclear whether, and how, the previously defined functions define the modulation orders. For the purpose of claim examination, the phrase is interpreted as "summing the created functions for each modulation order". Correction or amendment is required.

xiii. Regarding claim 16, the claim recites in line 5, "a complex wave Y". It is unclear whether the wave is complex because it contains imaginary terms, or whether the wave is complex because it is wiggly (for lack of a better technical term). The term "complex" to represent the shape of the curve is vague and indefinite. For the purpose of claim examination, the phrase is interpreted as, "a wave Y".

xiv. Regarding claim 17, the claim recites in lines 2 - 3, "the accumulation of the deviation of the arc length from the arc length of the mean pitch size". The meaning of the phrase is unclear, and therefore the metes and bounds of the claim cannot be determined. For the purpose of claim examination, the phrase is interpreted as not being in the claim.

xv. Regarding claim 17, the claim recites in line 4, "the Y curve". The term appears to have insufficient antecedent basis. For the purpose of claim examination the phrase is interpreted as, "a curve of the Y wave".

xvi. Regarding claim 17, the claim recites in line 13, "the equation". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "an equation".

xvii. Regarding claim 18, the claim recites in line 2, "the total number of pitches". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "a total number of pitches".

xviii. Regarding claim 18, the claim recites in line 2, "the number of different pitch sizes". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "a number of different pitch sizes".

xix. Regarding claim 18, the claim recites in lines 2 - 3, "the pitch ratios". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "pitch ratios".

xx. Regarding claim 21, the claim recites in lines 6 - 7, "creating a function for each modulation order that includes the defined amplitudes and phases". It is unclear whether each function contains all defined amplitudes and phases, or whether each function includes only the defined amplitude and phase for the modulation order. For the purpose

of claim examination, the phrase is interpreted as "creating a function for each modulation order that includes the defined amplitude and phase of the modulation order". Correction or amendment is required.

xxi. Regarding claim 21, the claim recites in line 8, "summing the functions that define the modulation orders". It is unclear whether, and how, the previously defined functions define the modulation orders. For the purpose of claim examination, the phrase is interpreted as "summing the created functions for each modulation order". Correction or amendment is required.

xxii. Regarding claim 21, the claim recites in lines 8 - 9, "a complex wave Y". It is unclear whether the wave is complex because it contains imaginary terms, or whether the wave is complex because it is wiggly (for lack of a better technical term). The term "complex" to represent the shape of the curve is vague and indefinite. For the purpose of claim examination, the phrase is interpreted as, "a wave Y".

xxiii. Regarding claim 21, the claim recites in lines 10 - 11, "the accumulation of the deviation of the arc length from the arc length of the mean pitch size". The meaning of the phrase is unclear, and therefore the metes and bounds of the claim cannot be determined. For the purpose of claim examination, the phrase is interpreted as not being in the claim.

xxiv. Regarding claim 21, the claim recites in line 12, "the Y curve". The term appears to have insufficient antecedent basis. For the purpose of claim examination the phrase is interpreted as, "a curve of the Y wave".

xxv. Regarding claim 21, the claim recites in line 13, "the equation". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "an equation".

xxvi. Regarding claim 22, the claim recites in lines 1 - 2, "the total number of pitches". The term has insufficient antecedent basis. For the purpose of claim examination, the phrase is interpreted as, "the total number of pitches".

xxvii. **Claims 2, 4 and 7 - 14** are rejected based on their dependency on their respective intermediate and parent claims which are rejected under 35 U.S.C. 112.

Claim Rejections - 35 USC § 101

16. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

17. **Claims 1 - 18 and 21 - 22** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

a. Regarding claims 1 and dependent claims, the recited method appears to contain abstract ideas, such as creating a function. Therefore, to be statutory, the claim must be directed to a practical application having a concrete, useful and tangible result. The claims do not appear to produce a tangible result needed to

support a practical application. Further, the method appears to be directed entirely to an abstract idea because the claim lacks a practical application.

b. Regarding claims 15 and dependent claims, the recited method appears to contain abstract ideas, such as creating a function. Therefore, to be statutory, the claim must be directed to a practical application having a concrete, useful and tangible result. The claims do not appear to produce a tangible result needed to support a practical application. Further, the method appears to be directed entirely to an abstract idea because the claim lacks a practical application.

c. Regarding claims 21 and dependent claims, the recited method appears to contain abstract ideas, such as creating a function. Therefore, to be statutory, the claim must be directed to a practical application having a concrete, useful and tangible result. The claims do not appear to produce a tangible result needed to support a practical application. Further, the method appears to be directed entirely to an abstract idea because the claim lacks a practical application.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Claims 1 - 2, 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula (U.S. Patent Number 4,442,499) in view of Kogure (U.S. Patent Number 5,383,506).

- a. The art of Sekula is directed to a method for producing pneumatic tires having pre-selected noise characteristics (Title and Abstract).
- b. The art of Kogure is directed to the art of pneumatic tires having reduced noise (Title and Abstract).
- c. The art of Sekula and the art of Kogure are analogous art because they both contain the art of noise reduction for pneumatic tires.
- d. Regarding claim 1:
- e. Sekula appears to teach:
 - i. defining the amplitudes of the modulation orders (figure 1, element 12; it would have been obvious that element 12 produced an amplitude of a modulation order; and figure 4; and column 2, lines 25 - 30; and column 4, lines 31 - 55; and column 10, lines 50 - 67);
 - ii. defining the phases for each modulation order (figure 1, element 12; it would have been obvious that element 12 produced a phase of a modulation order; and figure 4; and column 2, lines 25 - 30; and column 4, lines 31 - 55; and column 10, lines 50 - 67);
 - iii. creating a function for each modulation order that includes the defined amplitudes and phases (figure 1, element 12; it would have been obvious that element 12 produced a cosine function for each modulation order; and figure 4; and column 2, lines 25 - 30; and column 4, lines 31 - 55; and column 10, lines 50 - 67);
 - iv. summing the functions that define the modulation orders (figure 1, element 11; it would have been obvious that element 11 produced a wave that was the sum of the functions; and column 2, lines 20 - 25; and column 4, lines 31 - 55; and column 10, lines 50 - 67);

- v. defining the tire noise pitch sequence from the summation of the functions (column 2, lines 35 – 55; and column 10, lines 50 - 67).
- f. Sekula does not specifically teach:
 - i. selecting a number of modulation orders;
- g. Kogure appears to teach:
 - i. selecting a number of modulation orders (column 4, lines 10 - 15);
- h. The motivation to use the art of Kogure with the art of Sekula would have been the benefit recited in Kogure that the invention provides a pneumatic tire improved in comfort through an improved pitch arrangement to reduce pulsation sound pressure level (column 3, lines 5 - 14).
- i. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Kogure with the art of Sekula to produce the invention of claim 1.
- j. Regarding claim 2:
- k. Sekula appears to teach:
 - i. calculating a determined number of pitch sizes from the summation of the functions (column 2, lines 15 – 55; and column 10, lines 50 - 67).
- l. Regarding claim 6:
- m. Sekula does not specifically teach:
 - i. selecting the total number of pitches, the number of different pitch sizes, and the pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes.

- n. Kogure appears to teach:
 - i. selecting the total number of pitches, the number of different pitch sizes, and the pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes (column 3, lines 5 - 45).
- o. Regarding **claim 11**:
- p. Sekula does not specifically teach:
 - i. selecting between 3 and 7 modulation orders.
- q. Kogure appears to teach:
 - i. selecting between 3 and 7 modulation orders (column 3, lines 5 - 45; and figure 9).

20. **Claims 3 -5, 7 - 10 and 12 - 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula as modified by Kogure as applied to **claims 1 - 2, 6 and 11** above, further in view of Stuckey (U.S. Patent Application 2003/0040886).

- a. Sekula as modified by Kogure teaches a method for designing a tire noise pitch sequence as recited in **claims 1 - 2, 6 and 11** above.
- b. The art of Stuckey is directed to the art of analyzing tire tread patterns for tire noise.
- c. Regarding **claim 3**:
- d. Sekula does not specifically teach:
 - i. using the accumulation of the deviation of the arc length from the arc length of the mean pitch size.
- e. Stuckey appears to teach:
 - i. using the accumulation of the deviation of the arc length from the arc length of the mean pitch size (paragraphs [0031] - [0039]).

f. The motivation to use the art of Stuckey with the art of Sekula as modified by Kogure would have been the benefit recited in Stuckey that the invention allows eliminating tire designs having undesirable tire noise before sample tires are produced (paragraph [0026]).

g. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Stuckey with the art of Sekula as modified by Kogure produce the invention of claim 3.

h. Regarding claim 4:

i. Sekula does not specifically teach:

i. interpolating a curve defined by the accumulation of the deviation of the arc length from the arc length of the mean pitch size.

j. Stuckey appears to teach:

i. interpolating a curve defined by the accumulation of the deviation of the arc length from the arc length of the mean pitch size (paragraphs [0031] - [0039]).

k. Regarding claim 5:

l. Sekula does not specifically teach:

i. selecting the total number of pitches, the number of different pitch sizes, and the pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes.

m. Kogure appears to teach:

i. selecting the total number of pitches, the number of different pitch sizes, and the pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes (column 3, lines 5 - 45).

- n. Regarding **claim 7**:
- o. Sekula does not specifically teach:
 - i. setting the selected number of pitch sizes to a number between 3 and 7.
- p. Kogure appears to teach:
 - i. setting the selected number of pitch sizes to a number between 3 and 7 (column 3, lines 35 - 40).
- q. Regarding **claim 8**:
- r. Sekula does not specifically teach:
 - i. identifying the range of determined number of pitch sizes and evenly dividing the identified range by the selected number of pitch sizes.
- s. Stuckey appears to teach:
 - i. identifying the range of determined number of pitch sizes and evenly dividing the identified range by the selected number of pitch sizes (paragraph [0040]).
- t. Regarding **claim 9**:
- u. Sekula does not specifically teach:
 - i. selecting the number of different pitch sizes to be 5 and selecting the pitch ratios to be 1.00, 1.10, 1.25, 1.40, and 1.50.
- v. Kogure appears to teach:
 - i. selecting the number of different pitch sizes to be 5 and selecting the pitch ratios to be 1.00, 1.10, 1.25, 1.40, and 1.50 (column 3, lines 5 - 45).
- w. Regarding **claim 10**:
- x. Sekula does not specifically teach:
 - i. selecting the number of different pitch sizes to be 3 and selecting the pitch ratios to be 1.00, 1.25, and 1.50.

y. Kogure appears to teach:

- i. selecting the number of different pitch sizes to be 3 and selecting the pitch ratios to be 1.00, 1.25, and 1.50 (column 3, lines 5 - 45).

z. Regarding **claim 12**:

aa. Sekula does not specifically teach:

- i. defining the amplitudes of the first and second orders to be smaller than the amplitudes of the remaining orders.

bb. Stuckey appears to teach:

- i. defining the amplitudes of the first and second orders to be smaller than the amplitudes of the remaining orders (figure 2D).

cc. Regarding **claim 13**:

dd. Sekula does not specifically teach:

- i. defining the amplitudes of the first and second orders to be zero.

ee. Stuckey appears to teach:

- i. defining the amplitudes of the first and second orders to be zero (figure 2D).

ff. Regarding **claim 14**:

gg. Sekula does not specifically teach:

- i. varying the amplitudes for the selected modulation orders.

hh. Stuckey appears to teach:

- i. varying the amplitudes for the selected modulation orders (figure 2D).

21. **Claims 15 - 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula, in view of Stuckey (U.S. Patent Application 2003/0040886).

a. Regarding **claim 15**:

b. Sekula appears to teach:

- i. (a) first defining the characteristics of the tire noise generated by tire tread lug stiffness variations (column 2, lines 37 – 45; and figure 1, element 11);
- ii. (b) then defining a tire noise pitch sequence that yields the defined characteristics to provide preferred modulation characteristics and good level characteristics (column 2, lines 3 – 11 and lines 17 – 36; and column 10, lines 50 - 67).

c. Sekula does not specifically teach (portions not taught are marked in ***bold, italic, underline***):

- i. (a) first defining the characteristics of the tire noise ***generated by tire tread lug stiffness variations***;

d. Stuckey appears to teach:

- i. tire noise generated by tire tread lug stiffness variations (**Abstract**);

e. The motivation to use the art of Stuckey with the art of Sekula would have been the benefit recited in Stuckey that the invention allows eliminating tire designs having undesirable tire noise before sample tires are produced (paragraph [0026]).

f. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Stuckey with the art of Sekula produce the invention of claim 15.

g. Regarding **claim 16**:

h. Sekula appears to teach:

- i. Defining the amplitudes of at least five modulation orders (**figure 1, element 12; it would have been obvious that element 12 produced an**

amplitude of a modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67);

ii. Defining the phases for each modulation order (figure 1, element 12; it would have been obvious that element 12 produced a phase of a modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67);

iii. Creating a function for each modulation order that includes the defined amplitudes and phases (figure 1, element 12; it would have been obvious that element 12 produced a cosine function for each modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67);

iv. Summing the functions that define the modulation orders to create a complex wave Y (figure 1, element 11; it would have been obvious that element 11 produced a wave that was the sum of the functions; and column 2, lines 20 – 25; and column 4, lines 31 – 55; and column 10, lines 50 - 67);

i. Regarding claim 17:

j. Sekula appears to teach:

i. Solving the equation to obtain a unique set of pitch sizes (column 2, lines 17 – 36).

k. Sekula does not specifically teach:

i. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size;

ii. Setting the lug stiffness variation curve equal to the Y curve;

l. Stuckey appears to teach:

- i. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size (paragraphs [0031] - [0039]);
- ii. Setting the lug stiffness variation curve equal to the Y curve (paragraphs [0031] - [0039]);

22. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula as modified by Stuckey applied to **claims 15 - 17** above, further in view of Kogure (U.S. Patent Number 5,383,506).

a. Sekula teaches a method for defining tire noise pitch sequences as recited in claim 15 above.

b. Regarding **claim 18**:

c. Sekula does not specifically teach:

- i. selecting the total number of pitches, the number of different pitch sizes, and the pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes.

d. Kogure appears to teach:

- i. selecting the total number of pitches, the number of different pitch sizes, and the pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes (column 3, lines 5 - 45).

e. The motivation to use the art of Kogure with the art of Sekula would have been the benefit recited in Kogure that the invention provides a pneumatic tire improved in comfort through an improved pitch arrangement to reduce pulsation sound pressure level (column 3, lines 5 - 14).

f. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Kogure with the art of Sekula as modified by Stuckey to produce the invention of claim 18.

23. Claims 21 - 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula (U.S. Patent Number 4,442,499) in view of Kogure (U.S. Patent Number 5,383,506), further in view of Stuckey (U.S. Patent Application 2003/0040886).

a. The art of Stuckey is directed to the art of analyzing tire tread patterns for tire noise (**Abstract**).

b. Regarding claim 21:

c. Sekula appears to teach:

i. Defining the amplitudes of the modulation orders (**figure 1, element 12; it would have been obvious that element 12 produced an amplitude of a modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);

ii. Defining the phases for each modulation order (**figure 1, element 12; it would have been obvious that element 12 produced a phase of a modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);

iii. Creating a function for each modulation order that includes the defined amplitudes and phases (**figure 1, element 12; it would have been obvious that element 12 produced a cosine function for each modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);

iv. Summing the functions that define the modulation orders to create a complex wave Y (**figure 1, element 11; it would have been obvious that**

element 11 produced a wave that was the sum of the functions; and column 2, lines 20 – 25; and column 4, lines 31 – 55; and column 10, lines 50 - 67);

v. Solving the equation to obtain a unique set of pitch sizes (column 2, lines 17 – 36).

d. Sekula does not specifically teach:

- i. Selecting three, four, five, six, or seven modulation orders;
- ii. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size;
- iii. Setting the lug stiffness variation curve equal to the Y curve;

e. Kogure appears to teach:

- i. Selecting three, four, five, six, or seven modulation orders (column 4, lines 10 - 15);

f. Stuckey appears to teach:

- i. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size (paragraphs [0031] – [0039]);
- ii. Setting the lug stiffness variation curve equal to the Y curve (paragraphs [0031] – [0039]);

g. The motivation to use the art of Stuckey with the art of Sekula would have been the benefit recited in Stuckey that the invention allows eliminating tire designs having undesirable tire noise before sample tires are produced (paragraph [0026]).

h. The motivation to use the art of Kogure with the art of Sekula would have been the benefit recited in Kogure that the invention provides a pneumatic tire

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improved in comfort through an improved pitch arrangement to reduce pulsation sound pressure level (**column 3, lines 5 - 14**).

i. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Kogure and the art of Stuckey with the art of Sekula to produce the invention of claim 21.

j. Regarding **claim 22**:

k. Sekula does not specifically teach:

i. Selecting the total number of pitches, five different pitch sizes, and pitch ratios of 1.00, 1.10, 1.25, 1.40, and 1.50;

ii. Fitting the unique set of pitch sizes to the selected five pitch sizes.

l. Kogure appears to teach:

i. Selecting the total number of pitches, five different pitch sizes, and pitch ratios of 1.00, 1.10, 1.25, 1.40, and 1.50 (**column 3, lines 5 - 45**);

ii. Fitting the unique set of pitch sizes to the selected five pitch sizes (**column 3, lines 5 - 45**).

24. Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

Conclusion

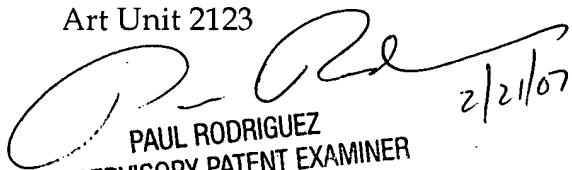
25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday - Friday 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RG

Russ Guill
Examiner
Art Unit 2123


PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100
2/21/07